

Supervised Learning: Regression

The first type of *supervised learning* that we'll look at is *classification*. Again, the main distinguishing characteristic of regression is the type of output it produces:

*In a **regression** problem, the output is numerical or continuous.*

Introduction to Regression

Intro to Regression

Common types of regression problems:

- Regression on tabular data
- Regression on image or sound data
- Regression on text data



Examples:

- Housing prices
- Customer churn
- Customer Lifetime Value
- Forecasting (time series)
- Anomaly detection

Common types of regression problems include:

- *Regression on tabular data:* The data is available in the form of rows and columns, potentially originating from a wide variety of data sources.
- *Regression on image or sound data:* Training data consists of images/sounds whose numerical scores are already known. Several steps need to be performed during the preparation phase to transform images/sounds into numerical vectors accepted by the algorithms.
- *Regression on text data:* Training data consists of texts whose numerical scores are already known. Several steps need to be performed during the preparation phase to transform text into numerical vectors accepted by the algorithms.

Categories of Algorithms

Regression Algorithms

Decision Forest Regression

- Ensemble learning method using multiple decision trees
- Each tree outputs a distribution for a prediction
- Aggregate to find a distribution closest to the combined distribution



Common machine learning algorithms for regression problems include:

- Linear Regression
 - Fast training, linear model
- Decision Forest Regression
 - Accurate, fast training times
- Neural Net Regression
 - Accurate, long training times

QUESTION 1 OF 2

Can you match each of these types of regression with the appropriate characteristics?

Submit to check your answer choice!

CHARACTERISTICS	REGRESSION TYPE
Accurate, fast training times	Decision Forest Regression
Accurate, long training times	Neural Net Regression
Fast training, linear model	Linear Regression

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QUESTION 2 OF 2

Match the following hyperparameters with their respective descriptions.

Submit to check your answer choice!

DESCRIPTION	HYPERPARAMETER
A value that defines the step taken at each iteration, before correction.	Number of learning iterations
Penalize models to prevent overfitting.	Learning rate
The maximum number of times the algorithm processes the training cases.	Gradient descent
A method that minimizes the amount of error at each step of the model training process.	L2 regularization weight

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